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Research Note
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Grizzly Bear Distribution in the Yellowstone Area, 1973-79[1]

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ABSTRACT

Reported sightings of grizzly bears or their sign in the Yellowstone area were compiled for the 1973-79 period and, where sufficient detail permitted, plotted on maps of 10 000 m grid. The 7-year composite of observations probably fairly represents the overall distribution of the grizzly bear. Factors meriting consideration in future monitoring are presented.

KEYWORDS: grizzly bear (*Ursus arctos horribilis*), Yellowstone area

At the start of the 19th century, the grizzly bear (*Ursus arctos horribilis* Ord) was distributed throughout much of arctic and temperate North America from about the 100th meridian to the Pacific Coast (Hall and Kelson 1959). Today, sizable populations still occupy vast expanses of Alaska and western Canada. But grizzlies in the lower 48 states now occupy only a small fraction of their former range and probably number less than 1,000.

The grizzly bear's rapid disappearance from large segments of its early 1800's range, and its decline in numbers, have been well documented (Storer and Trevis 1955; Hall and Kelson 1959; Stebler 1972; Cowan 1972). Diminution of its range and numbers did not result as much from habitat destruction as from the bear's incompatibility with humans. Early settlers considered the grizzly a constant threat to their lives and livestock, and eliminated it from their surroundings. Despite current concerns for the grizzly's survival, present day inhabitants are probably not much more tolerant of the grizzly than the settlers were.

Today's remaining grizzly bear populations owe their existence to the low frequency of bear/human encounters in their present ranges, which in turn stems from the wilderness character of these lands. Remoteness, ruggedness of topography, and costliness of resource exploitation have discouraged human intrusion in the past. However, people have recently penetrated these lands with commercial activities. These inroads, coupled with a high probability of increased exploitation in the immediate future, threaten the bear's remaining sanctuaries.

Forecasts of the grizzly's probable extinction in this century from one of these sanctuaries—the Yellowstone area—led to the formation of an Interagency Study Team to conduct research on the grizzly bear in that area, and to the July 28, 1975, declaration of the grizzly bear as a "threatened species" (Federal Register 40 FR: 31734-31736) pursuant to the Endangered Species Act of 1973.

Despite the decades-old popularily of grizzly bears in the Yellowstone area, no known documentation of their overall distribution existed before the Interagency Study. Because such knowledge is needed for sound management and for complying with provisions of the Endangered Species Act, a monitoring system was begun to determine grizzly bear distribution. This paper presents results of that monitoring from 1973 through 1979.

[1]This paper is a product of the Interagency Grizzly Bear Study, jointly sponsored by the National Park Service, U.S. Fish and Wildlife Service, USDA Forest Service, Idaho Department of Fish and Game, the Wyoming Game and Fish Department, and the Montana Department of Fish, Wildlife, and Parks.

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METHODS

Data on bear distribution came from two major sources: observations by study team members, and observations by others as relayed through cooperators. Team observations resulted from:

Aerial reconnaissance from a Piper Supercub. From 1974 through 1976, the major emphasis was on gathering information on bear numbers, sow to cub ratios, and litter sizes; accordingly, as often as weather permitted, flights covered predetermined routes when bears were active in open areas. A shift in emphasis dictated flight patterns from 1977 through 1979 when the major objective was to study movement patterns and habitat use of radio-collared bears. Bears both with and without radios were noted on all flights.

Ground reconnaissance. Field crews traversed approximately 2,800 miles (4 500 km) of trails from 1974 through 1976 seeking evidence of grizzly bears in areas of suspected but heretofore unconfirmed bear use.

Time lapse cameras. Automatic 8 mm movie cameras in weatherproof cases were used at varying types of bait stations to verify the presence of grizzlies in suspected use areas, and as part of a study on bear attractants in the Shoshone National Forest.

Routine field work. All grizzly bear sightings were reported on a standard form, as were sign encountered by team members. Grizzly bear tracks were differentiated from black bear tracks when possible, using criteria listed by Greer and Craig (1971). Scats over 2 inches (5 cm) in diameter were considered those of grizzly bear (Murie 1954).

Observations by persons other than team members were reported by local residents, outfitters, and field personnel of various agencies. These were verified when possible by team members or by other agency personnel.

Each report was classed as either verified (highly probable that it was a grizzly bear and not a black bear) or nonverified (insufficient evidence to judge its validity).

Insofar as possible, locations of observations were designated by Universal Transverse Mercator (UTM) values, and plotted accordingly on maps of 10 000 m grid. Because reports varied greatly in detail, many observations could not be located within the chosen map grid and are omitted from the results given here.

RESULTS

Numbers and distributions of grizzly bear sightings varied considerably from year to year (fig. 1-7). These variations may not be interpreted as reflecting trends in population or shifts in range use within the reporting period. Instead, they reflect the yearly inconsistencies in observability of bears and, more importantly, in the general monitoring scheme. For example, concentrated efforts in selected areas for specific study purposes usually resulted in many observations for 1 or 2 years in those areas, preceded and followed by years of very few or no observations. Too, the willingness of local residents to report grizzly bear sightings waxed and waned according to their imagined consequences of that reporting on their freedom to use grizzly bear range.

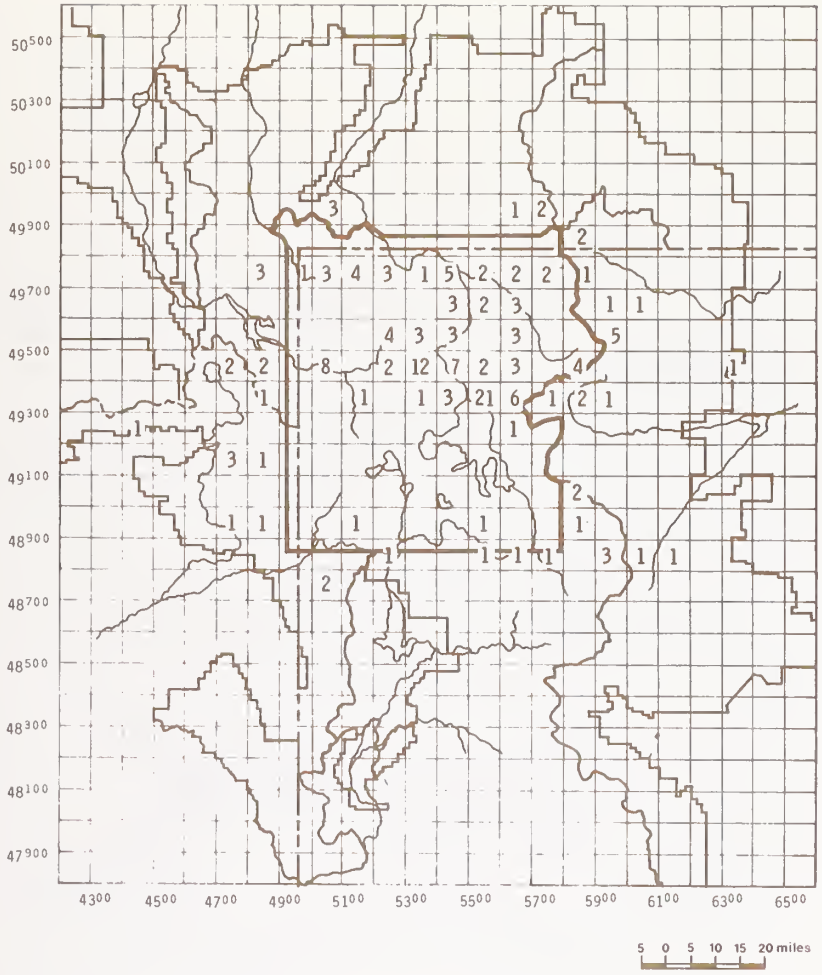

Figure 1.—Numbers of verified sightings of grizzly bears, 1973.

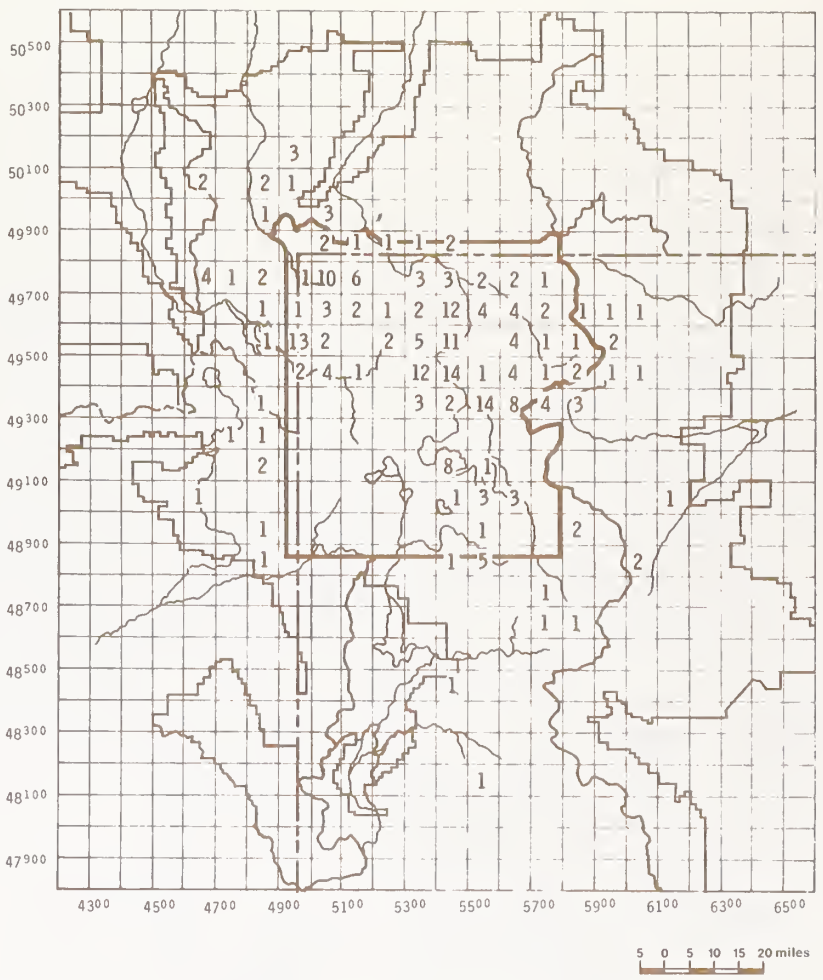

Figure 2.—Numbers of verified sightings of grizzly bears, 1974.

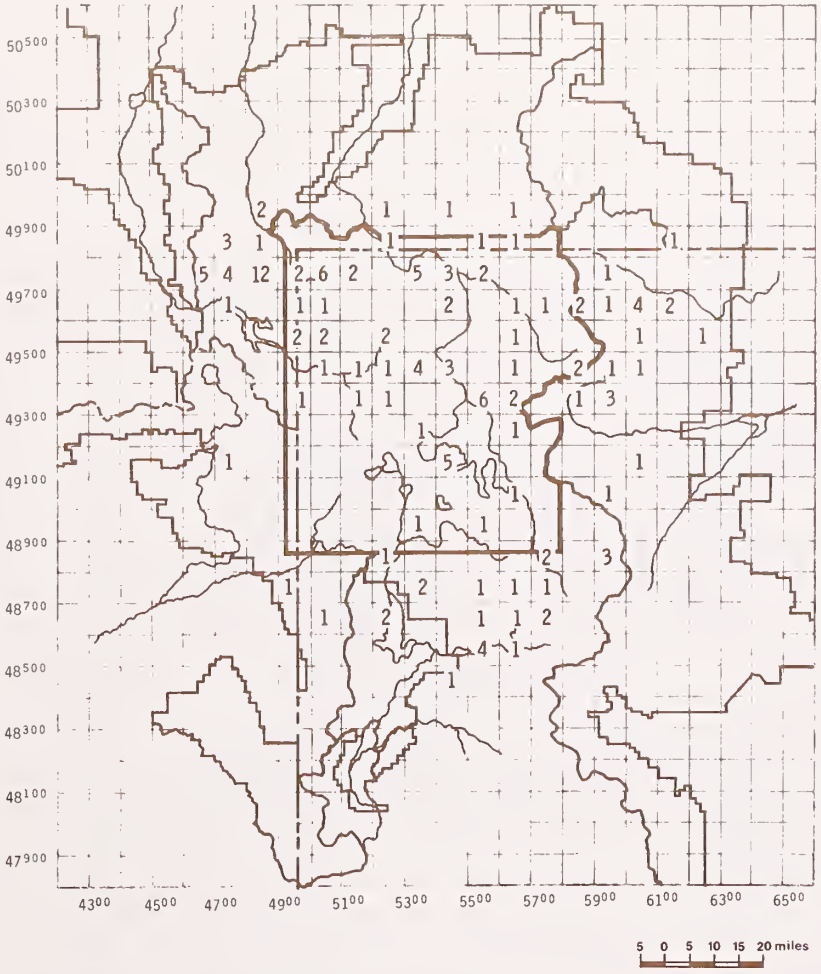

Figure 3.—Numbers of verified sightings of grizzly bears, 1975.

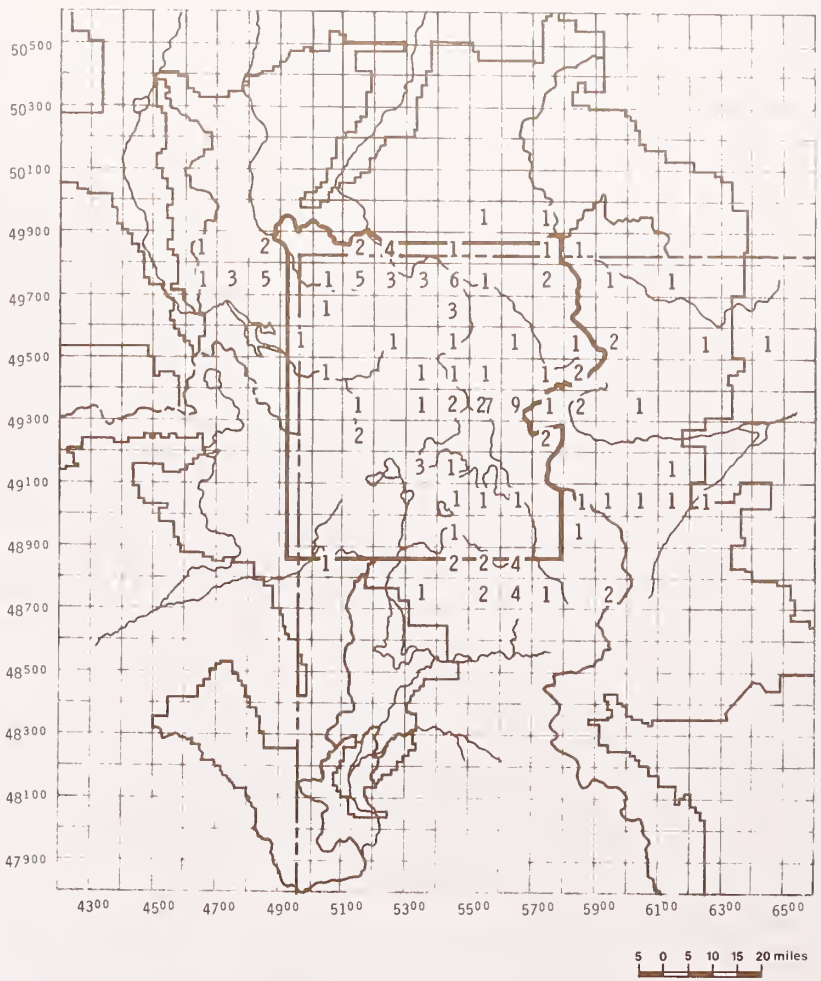

Figure 4.—Numbers of verified sightings of grizzly bears, 1976.

Figure 5.—Numbers of verified sightings of grizzly bears, 1977.

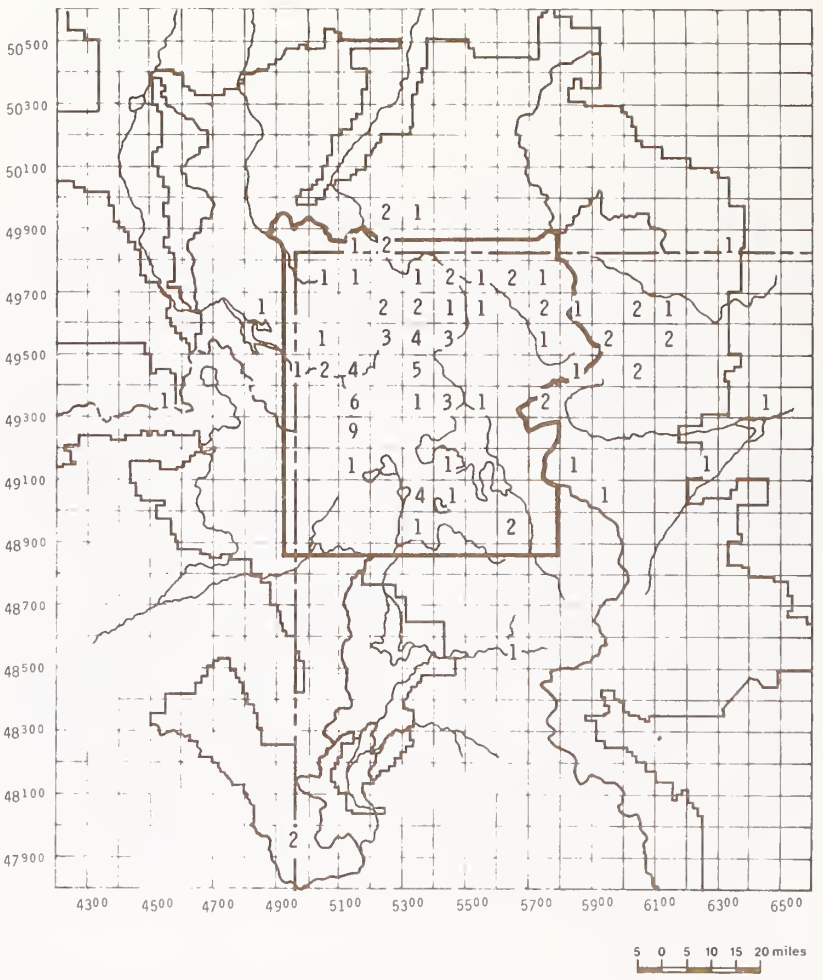

Figure 6.—Numbers of verified sightings of grizzly bears, 1978.

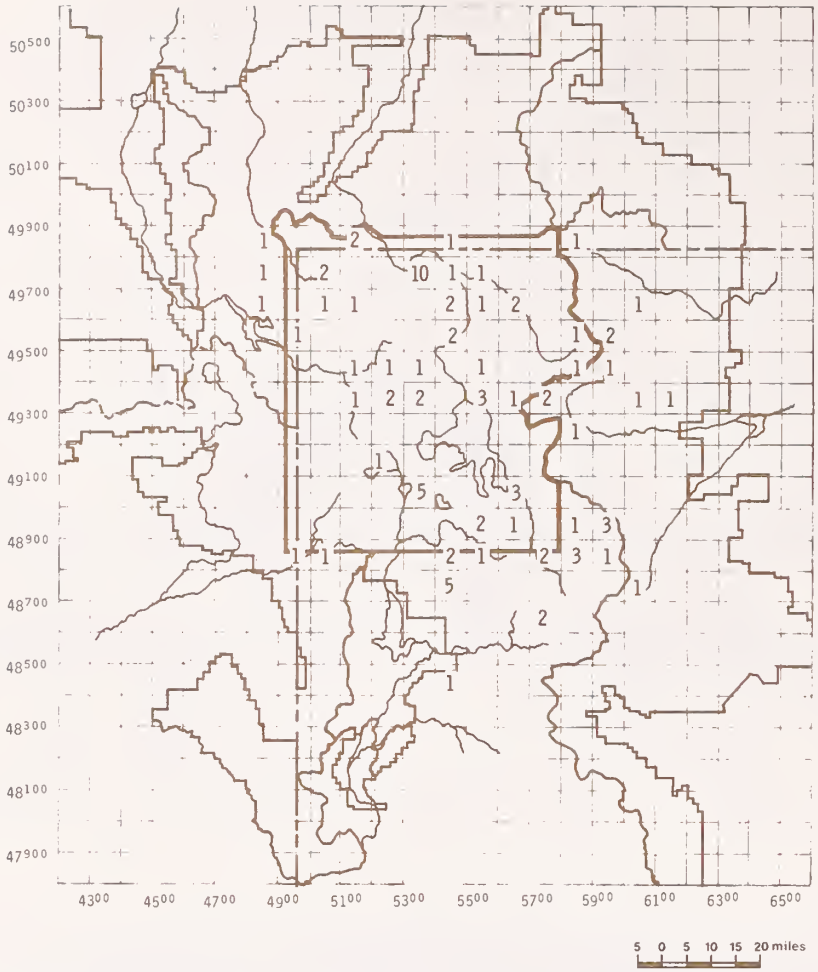

Figure 7.—Numbers of verified sightings of grizzly bears, 1979.

However, the 7-year composite of grizzly bear sightings (fig. 8) tends to smooth these inconsistencies, and when considered in concert with data on constancy of observations (fig. 9), probably represents fairly the overall range of the grizzly. Confidence in this conclusion is strengthened by the general agreement of this composite distribution of sightings with the composite distributions of capture locations (fig. 10), of locations of radio-instrumented bears (fig. 11), and of sightings of females with young (figs. 12 and 13).

Locations of family groups are important because a weaned female tends to establish a home range within the range of its mother, thereby lending some stability to occupation of an area (Pearson 1975). Sightings of family groups, then, provide greater confidence than do sightings of lone bears in delineating occupied areas and in distinguishing chance excursions outside those areas from probable range expansions.

A composite of all verified observations of grizzly bear sign for the 7-year period (fig. 14) does not produce any significant difference in the distribution of bears from that based on sightings (fig. 8). Interestingly, the same overall distribution is noted when all unverified sightings and sign are combined with all verified sightings and sign (fig. 15).

While these composites of observations yield a reasonable representation of occupied range, to detect confidently any future change in that occupancy requires a greater consistency in data collection from year to year. Several factors merit consideration in future monitoring:

Effort. Team monitoring of the geographical distribution of grizzlies should be equal with respect to time, frequency, and intensity of effort, and to area covered. Flights for this purpose should be separated from flights for other purposes.

Sources. Cooperation of the same individuals, or categories of individuals, should be sought each year among agencies, outfitters, stockmen, and local residents.

Reporting. Prompt submission of complete, accurate reports on standardized forms is invaluable, as is adherence to a procedure for verifying reports on grizzlies.

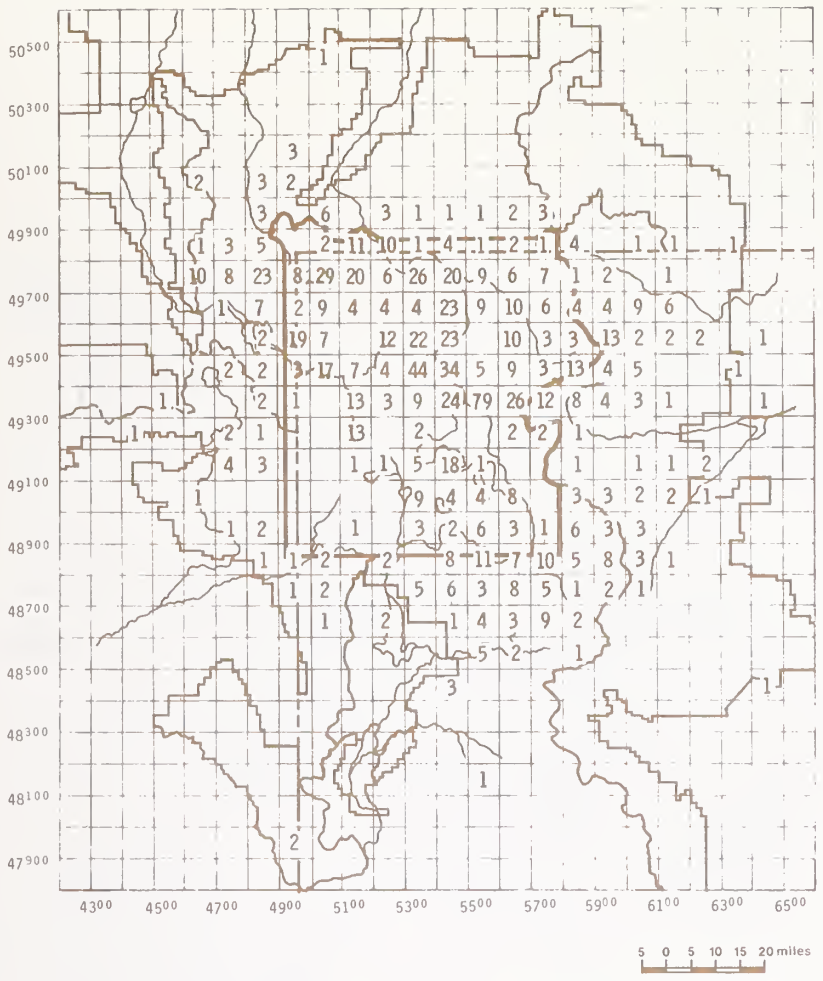

Figure 8.—Composite of verified sightings of grizzly bears for 7-year period, 1973-79.

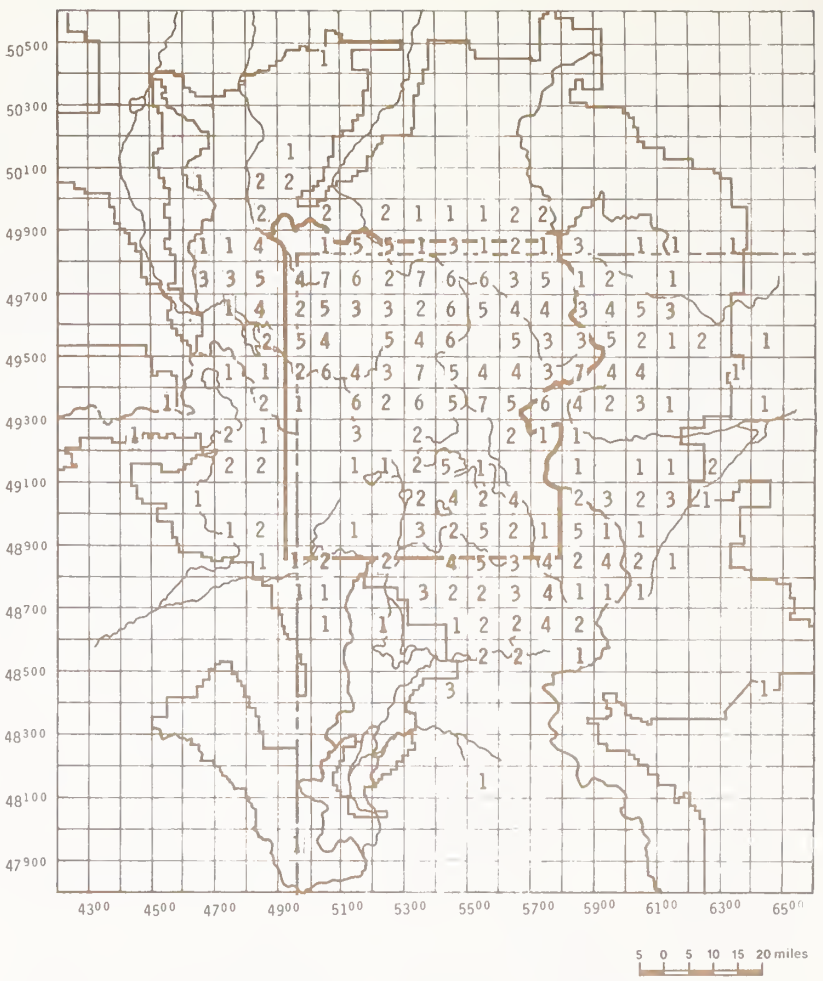

Figure 9.—Numbers of years in the 1973 through 1979 period that verified sightings of grizzly bears were reported.

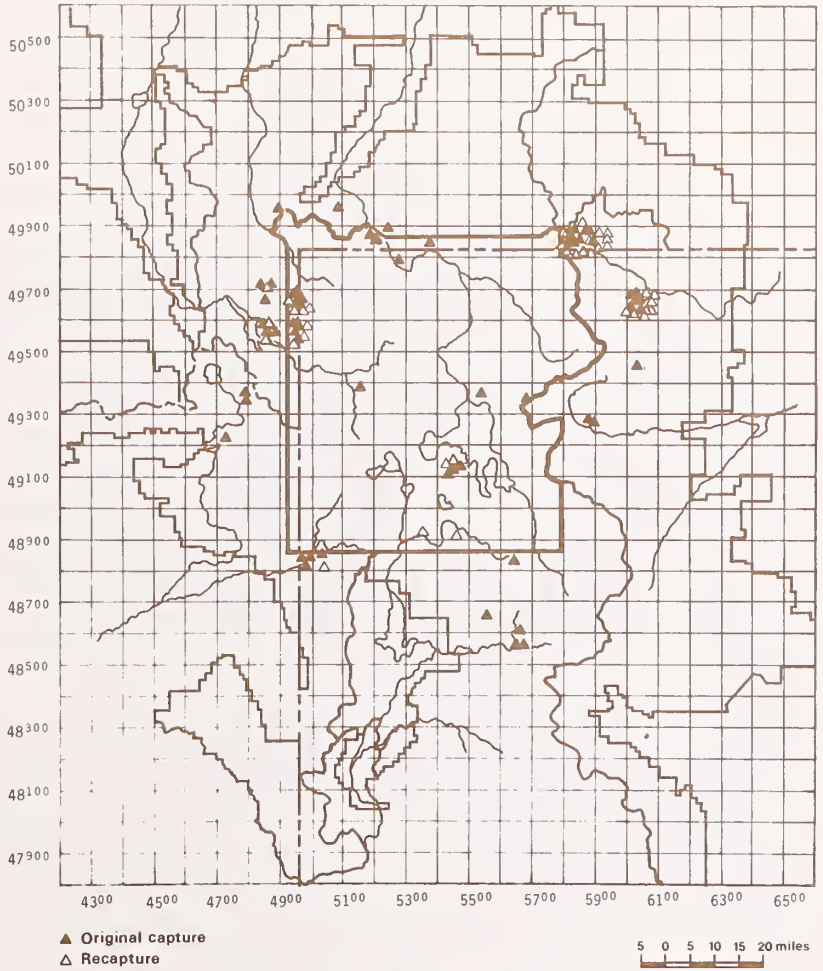

Figure 10.—Original capture and recapture locations of grizzly bears, 1974-79.

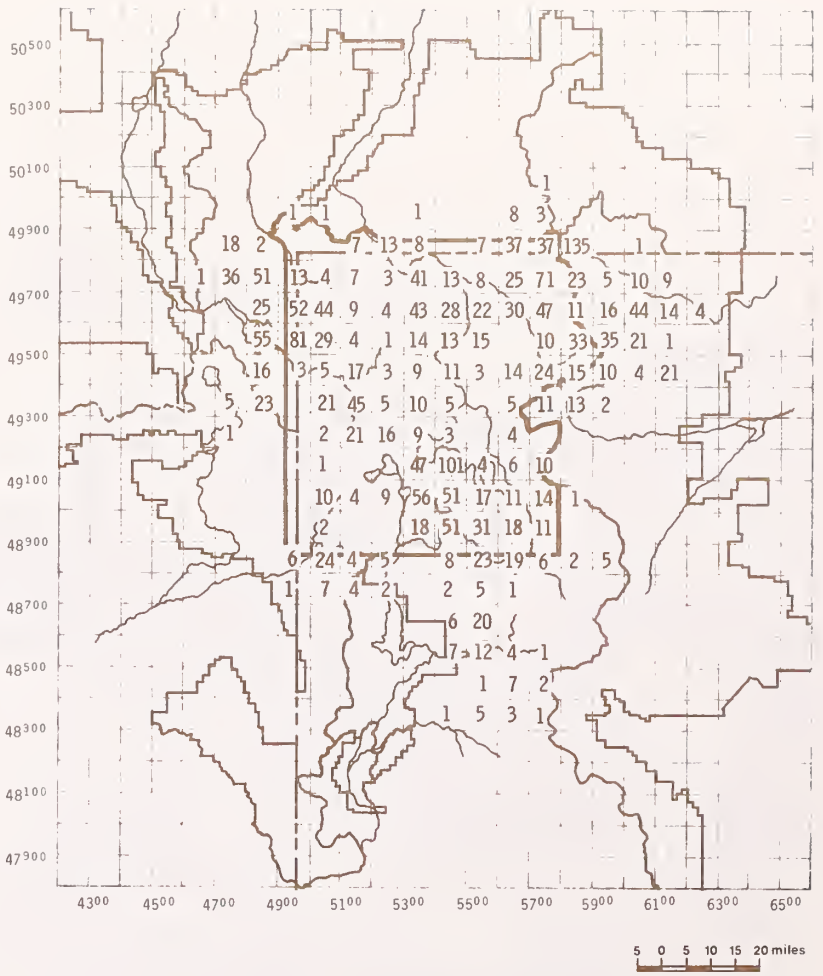

Figure 11.—Numbers of locations of radio-instrumented grizzly bears, 1975 through 1979.

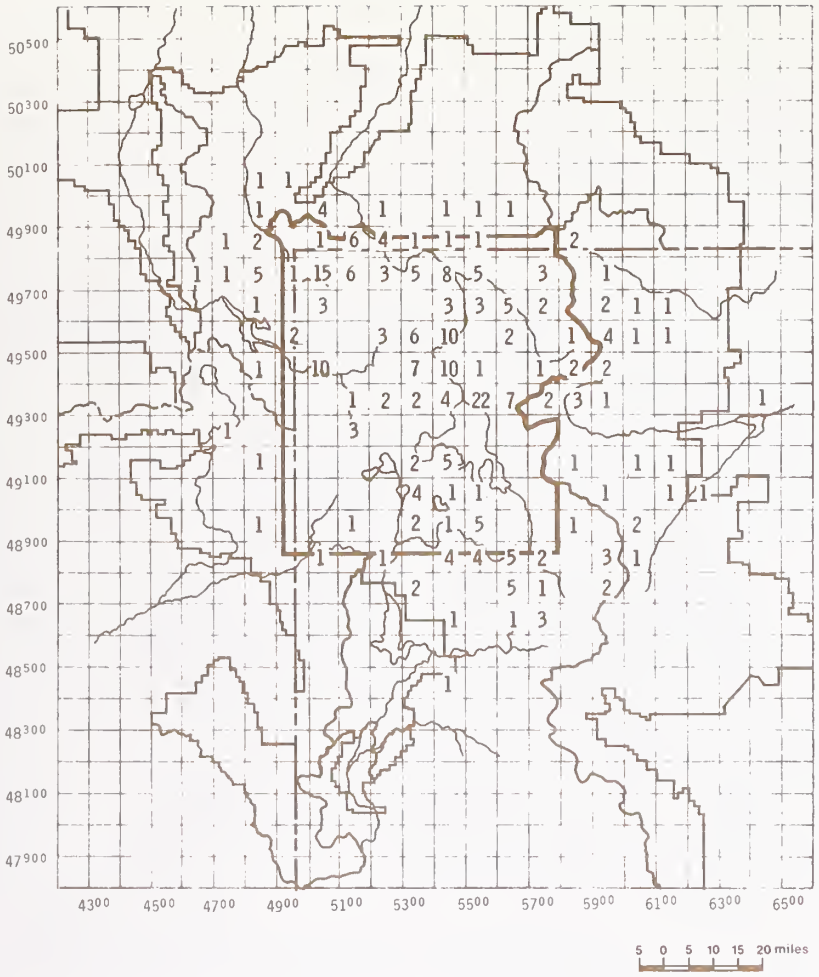

Figure 12.—Composite of verified sightings of female grizzly bears with young, 1973 through 1979 (does not include radio-instrumented bears).

Figure 13.—Numbers of years in the 1973 through 1979 period that verified sightings of female grizzly bears with young were reported.

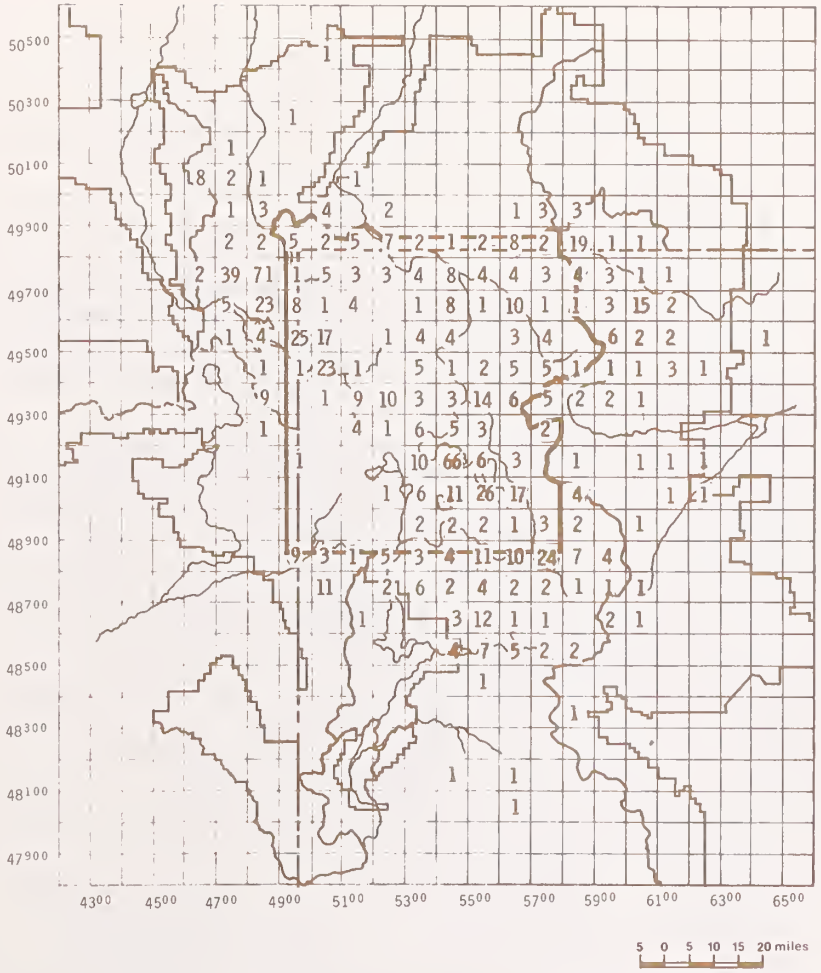

Figure 14.—Composite of verified observations of grizzly bear sign, 1973 through 1979.

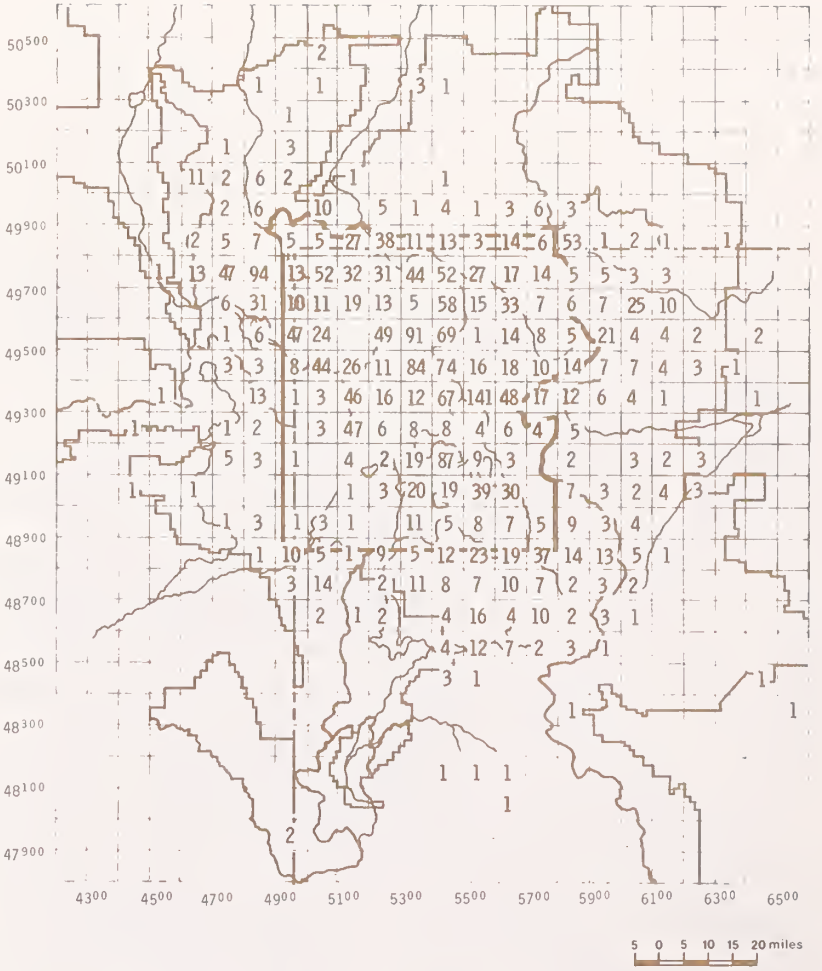

Figure 15.—Composite of all grizzly bear sightings and sign, verified and unverified, for years 1973 through 1979.

Other factors must be considered when interpreting results:

Observability of bears. When weather conditions in timber stands promote a luxuriant growth of herbaceous understory that retains its succulence well into summer, bears apparently find abundant forage without leaving protective cover (Knight and others 1976). Bears are less readily observed then than in drier years when bears are forced to forage more in open areas.

Observer attitudes. As Roop (1980) indicated, "The sociological and political climate of grizzly bear management can strongly influence the number of bear sightings reported by independent or nonagency forest users." Thus, any real or suspected change in bear management policy influences the willingness of individuals to report grizzly bear sightings according to how that information eventually may be used to their advantage or disadvantage.

Human use. Observations are only possible where people and bear use overlap, so areas of comparatively high or low bear observations must be evaluated with this in mind.

PUBLICATIONS CITED

Cowan, I. McT.
1972. The status and conservation of bears (*Ursidae*) of the world—1970. *In* Bears—their biology and management. p. 343-367. S. Herrero, ed. IUCN Publ. New Series 23.

Greer, K., and V. Craig.
1971. Bear hunting in Montana. 7 p. Mont. Fish and Game Dep.

Hall, E. R., and K. R. Kelson.
1959. The mammals of North America. Vol II. Ronald Press Co., New York.

Knight, R., J. Basile, K. Greer, S. Judd, L. Oldenburg, and L. Roop.
1976. Yellowstone grizzly bear investigations. Annual report of the Interagency Study Team—1975. U.S. Dep. Interior, Natl. Park Serv. Misc. Rep. 9, 46 p.

Murie, O. J.
1954. A field guide to animal tracks. 374 p. Houghton Mifflin Co., Boston.

Pearson, A. M.
1975. The northern interior grizzly bear *Ursus arctos* L. Can. Wildl. Serv. Rep. Series, No. 34, 86 p.

Roop, L.
1980. Grizzly bear. Wyo. Game and Fish Dep., Prog. Rep. W-27-R-30. 33 p.

Stebler, A. M.
1972. Conservation of the grizzly—ecologic and cultural considerations. *In* Bears—their biology and management. p. 297-303. S. Herrero, ed. IUCN Publ. New Series 23.

Storer, T., and L. P. Trevis, Jr.
1955. California grizzly. 335 p. Univ. Calif. Press, Berkeley and Los Angeles.

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